TIER II READING INTERVENTIONS: RESEARCH STUDY

By

C. Lee Goss

B.A. University of Virginia, 1981

M.S. University of Southern Maine, 2003

A THESIS

Submitted in Partial Fulfillment of the

Requirements for the Degree of

Doctor of Psychology

(in School Psychology)

The University of Southern Maine

December, 2008

Advisory Committee:

Rachel Brown-Chidsey, Associate Professor of School Psychology, Advisor

Mark W. Steege, Professor of School Psychology

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The purpose of this thesis is to describe a doctoral research study designed to implement response to intervention (RTI) techniques in reading for first grade students. RTI is an early intervention and prevention method for identification and effective intervention for students at-risk for developing academic problems. This research study focuses on research-based reading instruction and early identification and intervention for first grade students at-risk for developing reading problems. The effectiveness of two Tier II reading interventions, *Reading Mastery* and *Fundations 2*, are compared. The results indicated that all at-risk students made progress with supplementary intervention
following eight weeks of intervention and weekly progress monitoring. A comparison of Reading Mastery and Fundations 2 reading intervention results indicated that Reading Mastery students demonstrated the most significant progress. The findings are discussed in the context of the procedures necessary to implement and monitor RTI methods for students at-risk for developing reading problems in the early stages of literacy development.
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Chapter 1
LITERATURE REVIEW

There is a growing awareness among educational administrators and practitioners of the importance of additional research to determine the most effective interventions for struggling readers prior to a classification as learning disabled. Such efforts support public policy and legislation requirements in No Child Left Behind (NCLB; 2001), and the Individuals with Disabilities Education Improvement Act (IDEIA; 2004). A great deal of research has shown the core elements of effective reading instruction (National Reading Panel, 2000). In particular, response to intervention (RTI) methods provide a way to organize reading instruction across three levels, or tiers, of intensity (Brown-Chidsey & Steege, 2005). The first level, Tier I, includes universal instruction and assessment. Tier I is the research-based core curricula and assessments used for all students in the classroom setting. Tier II includes additional instruction and assessment, generally provided in small groups on a daily basis for students identified at-risk, or below the benchmarks for all students in Tier I. Tier III involves individualized, intensive instruction and assessment for students who do not respond to multiple research-based interventions in Tier II, along with a comprehensive evaluation to determine whether the student meets the diagnostic criteria for special education services. A review of the research indicates that more work is needed to identify the combinations of research-based supplemental reading interventions that are most effective for students who are making minimal gains in general education programs (Linan-Thompson & Davis, 2002). Additional research is needed regarding the use of trained
paraprofessionals to implement Tier II interventions to provide economically feasible and consistent programs for students at-risk for difficulties learning to read.

The National Reading Panel (NRP, 2000) research clarified that one of the essential ingredients for reading success is mastery of the alphabetic principle. A proven method to ensure mastery of the alphabetic principle is through explicit instruction in phonemic and phonological awareness. Foorman and Torgesen (2001) emphasized that children at-risk for reading failure acquire reading skills more slowly than other children and benefit from instructional support that is more explicit, comprehensive, and intensive. Recent intervention research with children at risk for reading failure has provided powerfully converging evidence that phonemically explicit interventions are an important feature of effective reading interventions for at-risk readers (Daly, Chafouleas, Persampieri, Bonfiglio, & LaFleur, 2004; Scheule & Boudreau, 2008). Increasing the intensity of instruction for at-risk readers is accomplished through small group instruction to address the need for a slower pace of instruction, along with additional opportunities for modeling, repetition, and practice.

Foorman and Torgesen (2001) also highlighted that an interesting finding of meta-analyses of grouping practices that increase the intensity of instruction for at-risk readers is that small group interventions appear to be as effective as individual instruction. The need for learning support through sequential scaffolded instruction, feedback and positive reinforcement, as well as emotional support through encouragement, was underscored by the authors as an important aspect of the implementation of effective reading instruction interventions for at-risk readers.
Cavenaugh, Kim, Wansek and Vaughn (2004) concluded that a body of twenty years of research document significant empirical evidence in support of implementing scientifically based reading interventions for identified at-risk kindergarten students. A more recent study by O’Connor, Harty and Fulmer (2005), examined the effects of increasing levels of intervention in reading for a sample of children in kindergarten through third grade to determine the effect of intervention on the severity of reading disability. The Tier II intervention consisted of reading instruction delivered to small groups of two to three students three times per week. In first grade, Tier II small group instruction occurred for 20 to 25 minutes three times per week, in addition to their classroom reading instruction. O’Connor, Harty and Fulmer (2005) showed that a model of tiered interventions helped students who struggled with acquiring basic literacy skills and could inform effective alternative instruction before a student is referred for special education services. Results indicated that direct early intervention in Tiers II and III for students eventually identified with a reading disability showed moderate to large effect sizes in terms of reducing the number of students later diagnosed with a learning disability.

Schatschneider, Francis, Fletcher, Carlson, and Foorman. (2004) showed that phonological awareness, rapid automatic naming (RAN) of letters, and knowledge of letter sounds were most predictive of reading achievement. They concluded that prevention is only possible if those who are in greatest need are identified early in their development (Schatschneider et al., 2004). Early identification of students at-risk requires accurate assessment of student pre-reading skills. Rouse and Fantuzzo (2006) provided an important study of the validity of the Dynamic Indicators of Basic Early Literacy
Skills (DIBELS) measures of Letter Naming (LNF) Nonsense Words (NWF), and Phoneme Segmentation Fluency (PSF) administered in kindergarten with measures of specific literacy constructs (i.e., alphabet knowledge, conventions of print, and meaning from print). Predictive validity evidence for the DIBELS LNF, NWF, and PSF was demonstrated, with significant correlated outcome relationships with reading, vocabulary, and language constructs measured at the end of first grade. Letter Naming evidenced the largest correlation coefficients, followed closely by Nonsense Words (Rouse & Fantuzzo, 2006). Results showed Letter Naming to be the most significant kindergarten predictor of first-grade reading, vocabulary, and language. Phoneme Segmentation emerged as the second strongest predictor (Rouse & Fantuzzo, 2006).

Despite the strong evidence concerning what type of instruction best helps struggling readers, Chard and Kame‘enui (2000) showed that most instruction for at-risk readers may not be aligned with recent research on preventing reading difficulties, and even identified at-risk readers receiving scientifically-based reading instruction may be only making minimal progress. These research results indicated that the observed reading instruction practices did not provide adequate opportunities for students who are struggling to learn to apply and practice knowledge and skills. Wanzek, Dickson, Bursuck and White (2001) analyzed four phonological awareness instructional programs according to the extent to which they incorporated five principles of effective instructional design related to teaching students at risk for reading failure; the five “big ideas” are based on work by Simmons and Kame‘enui (2008) and include: mediated scaffolding, strategic integration, conspicuous strategies, primed background knowledge, and judicious review. Of the four phonological awareness instructional programs
studied, Phonemic Awareness in Young Children, Ladders to Literacy, and Phonological Awareness Training for Reading were shown to provide strong components in many of the curriculum design principles except for primed background knowledge, and required the fewest adaptations for at-risk learners (Wanzek, Dickson Bursuck & White, 2001). The researchers concluded that Reading Readiness required the most adaptations and a very knowledgeable teacher to be used effectively. Results of the analysis revealed that no program effectively included all five principles, indicating that teachers need to be aware of the instructional components of selected programs and modify programs to improve their effectiveness.

Linan-Thompson and Hickman-Davis (2002) examined the effects of a research-based intervention for students at risk for reading difficulties which included intensive, explicit, and systematic reading instruction in five areas: fluency, phonemic awareness, instructional-level reading with an emphasis on comprehension, word analysis, and spelling delivered daily in a 30-minute small group lesson formats, 1:1, 1:3, and 1:10 for thirteen weeks. The authors reported that this intervention was effective in improving the reading skills of diverse learners, including low SES, second-grade English monolingual (MEL) and English-language learners (ELL). Features of instruction that appear to have been critical to student growth across instructional elements were the use of progress monitoring, teaching to mastery and holding students accountable, and comprehension checks throughout the session (Linan-Thompson & Hickman-Davis, 2002). Analysis of the group data showed students in 1:1 groups did not make significantly higher gains than students in 1:3 groups; this finding has significant implications for instructional resource
allocation in schools (Linan-Thompson & Hickman-Davis, 2002; Vaughn, Linan-Thompson, Kouzemanani, Bryant, Dickson, & Blozis, 2003; Wanzek & Vaughn, 2007).

Kamps and Greenwood (2005) highlighted the finding that as many as 82% of the students in their study showed reading risk in the beginning of their first grade year based on low scores on the fall DIBELS Nonsense Word fluency Measure. High risk levels also were observed later in the school year based on students’ poor oral reading rates from the winter DIBELS assessment. Results of this initial study showed key differences among the groups, with benefits of accelerated rates of growth for the experimental groups due to phonics- based curricula with supplemental small group instruction, increased amounts of time spent on active reading engagement, higher levels of teacher praise and lower levels of reprimands for intervention schools, and higher scores on the DIBELS winter and spring assessments for Nonsense Word Fluency and Oral Reading Fluency (Kamps & Greenwood, 2005). The researchers also noted that the study showed a need for more fluency practice within intervention to improve oral reading scores by the end of first grade.

Joshi, Dahlgren and Boulware-Gooden (2002) examined the efficacy of a multi-sensory teaching approach to improve reading skills at the first-grade level. Joshi et al. (2002) concluded that results of the study showed that the treatment group demonstrated gains in all of the variables measured, including phonological awareness, decoding, and comprehension, in contrast to the control group which only showed gains in comprehension. Phonological awareness and decoding are significantly correlated with oral reading fluency, and oral reading fluency is highly correlated with continued development of reading comprehension (NRP, 2000). Through their study, Joshi et al.
(2002) provided additional evidence that systematic phonics instruction from the very early grade levels is an effective tool to combat reading failure and should become a part of the curriculum at every school.

Torgesen, Alexander, Wagner, Rashotte, Voeller, and Conway (2001) researched the effect of two intervention programs *Auditory Discrimination in Depth* (ADD), and *Embedded Phonics* (EP). Both of the intervention programs included explicit instruction in phonological awareness, decoding, and sight word vocabulary of high-frequency words. Although each program differed in depth and extent of instruction in phonemic awareness and phonemic decoding skills, the researchers reported that children with severe reading disabilities showed significant improvements in generalized reading skills that were stable over a 2-year follow up period. An important finding of this study is that within 1 year following the intervention, 40% of the children were found to be no longer in need of special education services. These findings emphasize the importance of early intervention and explicit instruction in phonemic awareness and phonological awareness. Although almost half of the students demonstrated average-level reading skills by the end of the follow-up period, analysis of the results revealed a significant increase in word reading accuracy, but not reading rate in connected text. The significant progress in reading skills, in contrast to a lack of progress in reading rate for most children in this study highlights the importance of focusing resources on the prevention of reading difficulties in the early stages, and suggests a need to further develop interventions in this area.

A review of the literature showed the efficacy of identification and early intervention for early reading skills. With the combination of scientifically based
universal instruction (Tier I) and school wide early intervention screening measures in place to identify students at-risk for reading failure (i.e., DIBELS), the majority of evidence supported the findings that Tier II interventions can significantly reduce the number of children who experience the inability to close the gap from poor reading achievement to expected levels of reading achievement (Laurice, 2008). Progress monitoring is essential to determine if the level and type of intervention is successful, so modifications of the intervention can be made as needed (Linan-Thompson & Hickman-Davis, 2002; Kamps & Greenwood, 2005; Shapiro, 2008; Shinn, 2007). With these features in place, general education teachers have the ability to close the widening gap of reading achievement, or Matthew Effect, for identifiable at-risk readers. Additionally, as shown by O’Connor et al. (2003), when responsive intervention practices are used, fewer children are likely to be identified as learning disabled and in need of special education instruction.

Critical features of research based reading instruction include scientifically based systematic, explicit classroom instruction with additional small group reading instruction for at-risk students in Tier II interventions. Interventions explored and identified in the research include programs consistent with the NRP (2000) findings which identified the five key elements of effective-research based reading instruction as: phonemic awareness, alphabetic principle (e.g. decoding), fluency, vocabulary, and comprehension. Features of research-based supplemental instruction include more intensive, explicit, systematic, and direct phonemically-based instruction in small groups. Effective supplemental instruction is scaffolded and delivered at a slower pace, providing multiple opportunities for repetition and practice. Frequent (weekly) progress monitoring data
should be gathered to assess the effectiveness of the reading intervention (Daly, Martens, Barnett, Witt, & Olson, 2007).

The purpose of this research study was to compare two Tier II reading instruction interventions. The target population was students in first grade at risk for reading failure. The hallmark of Tier II effective reading instruction interventions is longer periods of more intensive, small group, scientifically-based direct instruction, with frequent opportunities to practice, along with frequent progress monitoring to evaluate the student response. Tier II instruction is targeted to specific learning goals developed through Tier I at-risk screening benchmark data. A lack of response to Tier II interventions, determined by Tier II progress monitoring data, indicates the need for Tier III interventions, as well as a comprehensive evaluation and the possibility of the need for special education services.

The interventions selected for the study included Reading Mastery and Fundations 2. Reading Mastery was initially developed in the 1960’s and has been documented as an effective reading intervention in a number of studies (Schieffer, Marchand-Martells, Martella, & Simonsen, 2007). Fundations 2 is a new intervention and was developed as a general education application for teachers seeking to improve student reading skills. It is based on a reading intervention first developed for adolescents and adults, the Wilson Reading System. Wilson Reading System is an Orton-Gillingham research-based individualized or small group intensive reading intervention program that is frequently used in schools, particularly for the special education population (O’Connor & Wilson, 1995). Fundations 2 was developed specifically for children K-3, and is comparable in scope to the systematic and explicit instructional
principles of the *Wilson Reading System*. The *Fundations* curriculum offers teachers the option of Tier I classroom instruction, as well as Tier II and Tier III small group or individualized instruction, with shorter, age appropriate lessons and materials.
Chapter 2

METHOD

Research Design

The single subject case study design was selected because it is well suited to the study of Tier II interventions. Case study design incorporates both baseline and intervention data. It demonstrates whether a specific intervention was effective. Because DIBELS measures were used, a limited baseline phase was implemented. Research on DIBELS has shown it to be highly reliable and predictive of reading skill. In the fall benchmark screening period, three separate measures were administered to each student in one session. These three data points together represent a highly predictive baseline indicator of student reading performance. Additional sequential baseline data points were not needed because of the overall established reliability of DIBELS when three data points are collected in one session. Although (AB) case study design does not have the benefit of a withdrawal condition, the study of reading behaviors is well matched to an (AB) case study design because reading behaviors are not likely to revert with a withdrawal condition.

Participants

A sample of 12 first grade students identified significantly at-risk for acquisition of basic early literacy skills from two intact classrooms were selected to participate in the study. Participants attended a public elementary school in a suburban town located in the Northeast United States. Inclusion criteria for the research study included any student enrolled in the two first grade classrooms participating in the study. Exclusion criteria for participants included any identified at-risk first grade student who was already
receiving special education service as the result of an individualized educational plan. Six girls and six boys participated in the study. All of the subjects were Caucasian. One of the female students repeated kindergarten prior to entering first grade. One of the students received free or reduced lunch. Students who were identified in the at-risk range on universal screening measures and confirmed by teacher judgment, were selected for participation in the Tier II small group reading interventions. The twelve students were randomly assigned to a treatment group for more intensive supplementary reading instruction on the basis of their initial benchmark screening scores and at-risk status. Tier II groups were designed to have between 3 and 6 students. In order to compare the effects of two different specific interventions, the students were matched in dyads according to their baseline reading data. Each member of the dyad was randomly assigned to participate in one of two different reading interventions: Reading Mastery or Wilson Fundations 2. Following random assignment by dyads, four females and two males received Reading Mastery supplemental intervention. This group included the female who repeated kindergarten, as well as the female who received free and reduced lunch. Four males and two females participated in the Wilson Fundations 2 supplemental reading intervention.

Dependent Measures

All children in the target general education classrooms were individually assessed by the research team members using the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) and the Texas Primary Reading Index (TPRI). All first grade benchmark screening assessments were administered to all children in both classrooms in one individual student session. All evaluators were thoroughly trained in the
administration and scoring of these instruments. The DIBELS first grade benchmark assessments include Letter Naming Fluency (LNF), a measure of correct letter identification of a random sequence of upper and lower case letters, Phoneme Segmentation Fluency (PSF), a measure of correct sound segments, Nonsense Word Fluency (NWF), a measure of correct letter sounds, and Oral Reading Fluency (ORF), a measure of words read correctly in connected text. The TPRI beginning of the year benchmark screening assessments including Grapheme Knowledge (GK), a measure of letter identification and letter sounds, Word Reading (WR), a measure of words read correctly in isolation, and Phonological Awareness (PA), a measure of correct sound segments, were completed for all children identified at-risk on the DIBELS benchmark assessments. The DIBELS and TPRI benchmark assessments were administered at the beginning and end of the study. In addition, all participants completed weekly DIBELS progress measures to show progress toward meeting reading goals.

In order to estimate assessment accuracy, 20% of DIBELS pre-test and 25% of DIBELS post-test screening assessments, and 25 % of TPRI post-test screening assessments were scored by two researchers. To determine point-by-point inter-rater agreement on the DIBELS pre-tests (e.g., LNF, PSF, and NWF) 8 of the Tier I students were randomly selected and scored simultaneously by two experienced examiners, the researcher and another master’s level school psychology doctoral student. Scores were compared on each subtest and determined to be in agreement if the scores were within 2 points on each individual subtest. In November, inter-rater agreement on the DIBELS post-tests (e.g., LNF, PSF, NWF, and ORF) was computed from data collected by the

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1 The DIBELS Administration and Scoring Procedural Checklist specifies that scores within 2 points of the actual score are considered accurate.
same examiners. 25%, or 10 students, were randomly selected, 5 from the Tier I sample, and 5 from the Tier II sample. Each student was scored simultaneously by the same two examiners. Scores were compared on each subtest and determined in agreement if the scores were within 2 points on each individual subtest. The same 10 randomly selected students were scored simultaneously by both examiners on the TPRI post-test. Point-by-point inter-rater assessment results, (e.g., the total of correct letters, correct sounds, correct letter segments, and correct words) indicated 75% inter-rater agreement on pre-test DIBELS screening assessments, and 88% inter-rater agreement on post-test DIBELS screening assessments, with 100% inter-rater agreement on the post-test TPRI screening assessments.

Materials

Two different Tier II reading interventions were used in this study: *Fundations 2* and *Reading Mastery*. The teachers of the general education classrooms from which the at-risk students were selected used the grade 1 *Fundations* with their entire classrooms. Both first grade classroom teachers were experienced teachers with over twenty years of elementary teaching experience. Each teacher received training in *Fundations* by the Wilson Language Training Center. One first grade classroom teacher was entering her second year of teaching *Fundations*, and the other first grade classroom teacher was teaching *Fundations* for the first time.

Those students identified at-risk of developing reading difficulties through the universal benchmark screening methods were randomly selected to participate in Tier II sessions using *Fundations 2* instruction or *Reading Mastery*. The *Fundations 2* lessons are intensive versions of the whole class *Fundations* program and include additional
direct instruction and practice of the core skills covered in the grade 1 *Fundations* program. Specifically, the program covers decoding, blending, acquisition of irregular English words, reading decodable connected text stories, handwriting, and spelling (Table 6). *Fundations 2* was selected as one of the interventions because it is a new intervention designed to provide systematic instruction in core reading skills; this study was designed to learn more about its efficacy. A general educational technician (i.e., paraprofessional) provided the small group *Fundations 2* intervention. She received training in *Fundations* by the Wilson Language Training Center prior to providing instruction. Student progress toward the middle first grade benchmark reading goal was monitored with the weekly PSF and NWF DIBELS subtests.

The second Tier II intervention used was *Reading Mastery*. This is a direct and systematic scripted reading program that focuses on teaching beginning readers how to read and comprehend through explicit instruction in phonics that emphasizes letter sounds and blending, sequential and scaffolded instruction, and multiple opportunities for repetition and practice of learned skills. At the first grade level, the *Reading Mastery* curriculum includes decoding, blending, acquisition of irregular English words, and reading decodable connected text stories (Table 7). *Reading Mastery* was selected as the second Tier II intervention because it has a very strong record of efficacy (e.g., Schieffer, Marchand-Martells, Martella, & Simonsen, 2007). The educational technician assigned to the *Reading Mastery* small group intervention had a master’s degree in literacy, along with professional experience administering literacy interventions with at-risk students. Prior to the small group intervention, she received direct training in *Reading Mastery* from the researcher. As with the *Fundations 2* intervention, student progress toward the
Table 1. *Fundations* and *Fundations 2* Lesson Components

<table>
<thead>
<tr>
<th>Lesson Components</th>
<th>Activity</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alphabetic Order (Unit 1 Only)</td>
<td>Students match letter tiles to Alphabet overlay</td>
<td>Standard Sound Cards, Baby Echo Pointer, Magnetic Letter Tiles and Letter Boards, Alphabet Overlay</td>
</tr>
<tr>
<td>Echo/Letter Formation (Unit 1 Only)</td>
<td>Students cued on writing position and pencil grip. Teacher says a sound and holds up Echo. Students repeat the sound and name the letter that makes the sound.</td>
<td>Letter Formation, Verbalization Guide, Echo the Owl, Wilson Writing Grid on Classroom Board, Pencil Grip Picture, Dry Ease Writing Tablet</td>
</tr>
<tr>
<td>Sky-Write/Letter Formation (Unit 1 Only)</td>
<td>Teacher models and directs sky-writing correct letter formation along with the letter-keyword-sound.</td>
<td>Letter Formation Guide, Wilson Writing Grid w/ Pictures</td>
</tr>
<tr>
<td>Vowel extension (Unit 1 Only)</td>
<td>Teacher extends the vowel sound while tracing the line to the keyword picture. Vowels reviewed every day.</td>
<td>Keyword Pictures</td>
</tr>
<tr>
<td>Letter-Keyword-Sound</td>
<td>New letters/sounds taught w/ sound cards</td>
<td>Echo the Owl or Baby Owl, Large Sound Cards, Standard Sound Cards</td>
</tr>
<tr>
<td>Drill Sounds</td>
<td>Teacher models letter-keyword-sound w/ Large Sound Cards &amp; Students Echo. Vowels reviewed every day</td>
<td>Large Sound Cards, Standard Sound Cards, Baby Echo Pointer</td>
</tr>
<tr>
<td>Echo/Find Letters</td>
<td>Teacher dictates a sound, students echo sound, students identify all letters that make the sound</td>
<td>Standard Sound Cards, Echo the Owl, Letter Board, Alphabet Overlay, Magnetic Tiles (only taught sounds)</td>
</tr>
<tr>
<td>Echo/Find Sounds &amp; Words</td>
<td>Teacher dictates the sound/word, students repeat the sound/word. Students identify all letters that make the sound and tap the sounds in words. Students identify the correct letter tiles to form the words on the Building Boards</td>
<td>Echo the Owl or Baby Echo, Standard Sound Cards Display, Magnetic Tiles, Building and Letter Boards</td>
</tr>
<tr>
<td>Trick Words</td>
<td>Trick words presented as words that cannot be tapped out and must be memorized. Teacher and students say, spell, and practice skywriting and writing trick words.</td>
<td>Board, Building Boards or Desk Surface, Student Notebook</td>
</tr>
<tr>
<td>Word of the Day</td>
<td>Word selected from the unit list and made w/ Standard Sound Cards, Defined, Used in a Sentence, &amp; Written on Index Card. Students write sentence in Student Notebooks</td>
<td>Standard Sound Cards, Blank 5x8 Index Cards, Baby Echo Pointer, Student Notebooks</td>
</tr>
</tbody>
</table>
Table 1. *Fundations* and *Fundations* 2 Lesson Components Continued

<table>
<thead>
<tr>
<th>Activity</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Word Talk</strong></td>
<td>Make, tap, &amp; discuss review &amp; new words of the Day (See Above).</td>
</tr>
<tr>
<td><strong>Dictation Sounds Dry Erase/Composition Book</strong></td>
<td>Teacher dictates sound. Students echo sound and write the letter that makes the sound.</td>
</tr>
<tr>
<td><strong>Dictation Words</strong></td>
<td>Teacher dictates a word from current unit. Students echo word. Teacher uses the word in a sentence. Students tap the word and orally spell before writing the word.</td>
</tr>
<tr>
<td><strong>Dictation Trick Words</strong></td>
<td>Teacher dictates trick word and teaches that trick words can’t be tapped</td>
</tr>
<tr>
<td><strong>Dictation Sentences</strong></td>
<td>Teacher dictates sentence in phrases. Selected student writes sentence on Blue Sentence Frame</td>
</tr>
<tr>
<td><em><em>Introduce New Concepts</em> Varies according to Unit Guide—Not on CD</em>*</td>
<td></td>
</tr>
<tr>
<td><em><em>Make It Fun</em> Varies according to Unit Guide—Not on CD</em>*</td>
<td></td>
</tr>
<tr>
<td><em><em>Storytime</em> Varies according to Unit Guide—Not on CD</em>*</td>
<td></td>
</tr>
<tr>
<td><em><em>Student Notebook 1</em> Varies according to Unit Guide—Not on CD</em>*</td>
<td></td>
</tr>
</tbody>
</table>

*Activities will vary each time

Table 2. *Reading Mastery* Lesson Components

<table>
<thead>
<tr>
<th>Activity</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lesson Components</strong></td>
<td><strong>Activity</strong></td>
</tr>
<tr>
<td><strong>Pronunciation</strong></td>
<td>Students say letter sounds</td>
</tr>
<tr>
<td><strong>Sounds--Oral</strong></td>
<td>Introduce new sounds</td>
</tr>
<tr>
<td><strong>Sequencing Games</strong></td>
<td>Students do what picture shows</td>
</tr>
<tr>
<td><strong>Sound—Say it Fast</strong></td>
<td>Oral task to listen to word or sounds teacher says, then &quot;say it fast&quot;</td>
</tr>
<tr>
<td><strong>Sounds--Visual</strong></td>
<td>Teacher crosses out all the identified letter sounds</td>
</tr>
<tr>
<td><strong>Sound Writing</strong></td>
<td>Teacher demonstrates letter formation w/ letter formation guide printed on paper</td>
</tr>
<tr>
<td><strong>Picture Completion</strong></td>
<td>Students cross out letters and complete/color picture</td>
</tr>
</tbody>
</table>
middle first grade benchmark reading goal was monitored with the weekly PSF and NWF DIBELS subtests.

Procedures

The twelve students identified as at-risk for reading difficulties were randomly assigned in dyads to a small group Tier II intervention, Reading Mastery or Fundations 2. Students were ranked by NWF baseline scores, then matched in dyads by closest baseline NWF score. The dyads were randomly numbered 1 for Reading Mastery, and 2 for Fundations 2. Six students were assigned to each Tier II group. In addition to daily classroom instruction, they were provided small group instruction four times per week for 30 minutes each session. In order to determine if the Fundations 2 and Reading Mastery programs were effective for the at-risk students, weekly progress measures were administered. The PSF and NWF DIBELS subtests were completed by the Tier II students each week. These data were used to determine if the students were making effective reading progress according to the methods described by Brown-Chidsey and Steege (2005) and Daly, Chafouleas, and Skinner (2005).

Intervention treatment integrity was assessed through weekly observations and teacher self-report scales. At least 20% of the intervention sessions were observed by the researcher to determine whether the published instructional steps were used correctly. Treatment integrity observations were conducted by the researcher every week for both Tier I Fundations classroom instruction, and Tier II supplementary small group interventions, Reading Mastery and Fundations 2. Tier I Fundations classroom reading instruction was provided daily at the same time with teacher coordinated lesson plans for each day. For treatment integrity observations the researcher observed the Tier I
classroom instruction once a week in each classroom for half the session of each lesson. The researcher observed the Tier II small group supplementary interventions weekly for the entire thirty minute intervention session. For each treatment integrity observation, the observer and each teacher completed a self-report checklist of curricula components accomplished for the lesson that day. The researcher reviewed both checklists for correspondence and inter-rater reliability. Verbal feedback was provided to each teacher based upon observations and the treatment integrity checklist agreement. A summary of treatment integrity data is shown in tables 1 and 2. These data show that the teachers administered the programs correctly and adhered to the instructional program with high fidelity.

Table 3. Tier 1 Treatment Integrity Observation Data (Accuracy Percentage)

<table>
<thead>
<tr>
<th>Class</th>
<th>Wk 1</th>
<th>Wk 2</th>
<th>Wk 3</th>
<th>Wk 4</th>
<th>Wk 5</th>
<th>Wk 6</th>
<th>Wk 7</th>
<th>Wk 8</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom 1</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Classroom 2</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 4. Tier 2 Treatment Integrity Observation Data (Accuracy Percentage)

<table>
<thead>
<tr>
<th>Group</th>
<th>Wk 1</th>
<th>Wk 2</th>
<th>Wk 3</th>
<th>Wk 4</th>
<th>Wk 5</th>
<th>Wk 6</th>
<th>Wk 7</th>
<th>Wk 8</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading Mastery</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>N/A</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Fundations 2</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>N/A</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Data Analysis

Individual student reading achievement data were measured and analyzed with single case design procedures. Multiple case studies were used to compare reading improvement by students in different conditions. Progress monitoring data were collected weekly and reviewed by the researcher every three weeks. Student progress was compared to the DIBELS and TPRI middle of the year first grade benchmarks.
Effectiveness of the interventions was evaluated with respect to non-overlapping data points between baseline and treatment conditions.

Since the study ended in November, prior to the recommended January benchmark date, adjusted benchmarks for NWF and ORF were calculated to assess adequate progress toward benchmark goals. Because LNF and PSF benchmarks are recommended benchmarks for the end of kindergarten, mastery of these benchmarks remains stable and an important indicator of at-risk status at the first grade level. An adjusted benchmark score for NWF was calculated by subtracting the identified September first grade NWF benchmark goal of 24 from the NWF January first grade benchmark goal of 50 which yields a desired gain of 26 on NWF. The typical school attendance duration between the September and January benchmarks is sixteen weeks. The expected gain of 26 was divided by sixteen to yield the expected weekly progress score for correct letter sounds on NWF of 1.625. To calculate the expected gain on the NWF probe during the eight week intervention 1.625 was multiplied by eight which yielded a needed gain of 13 correct letter sounds. To be on target to meet established January DIBELS benchmark goals, the adjusted November benchmark is the September NWF benchmark of 24 plus the needed gain of 13 correct letter sounds for an adjusted total November NWF benchmark goal of 37 correct letter sounds in one minute. This same formula was applied to the established DIBELS ORF January benchmark goal of 20 words read correctly in one minute. The expected gain each week of words read correctly in one minute to meet the January ORF benchmark goal of 20 words read correctly in one minute is 1.25 words per week over a 16 week timeframe. To adjust this figure for the eight week intervention timeframe, 1.25 words read correctly was
multiplied by 8 for a yield of 10 words read correctly in one minute expected gain for an adjusted November benchmark goal. Intervention effectiveness was determined by whether the students met benchmark goals.
Chapter 3

RESULTS

Effects of Tier II *Reading Mastery* and *Fundations 2* Supplementary Intervention

In this study, three types of data were collected and analyzed. These data include pre- and post-intervention first grade DIBELS scores (Table 3), pre-and post-intervention TPRI screening scores (Table 4), and PSF and NWF DIBELS weekly progress monitoring data (Table 5). The fall DIBELS screening data assessed the ability to read letters fluently in both upper case and lower case letters (LNF), the ability to fluently segment the sounds in words auditorily (PSF), and the ability to read correct letter sounds or nonsense words fluently (NWF) with one minute probes for each task. The TPRI screening measure assessed similar skills in a different way. Grapheme Knowledge was assessed by reading a combination of consonant and vowel upper case letters and providing the sound each letter makes within 10 seconds. Word Reading measured the ability to read real words accurately and fluently within 5 seconds. Phonological Awareness measured the student’s ability to hear the segments of a word and fluently identify the word auditorily.

Figures 1-6 depict the comparative dyad progress data for the six students who participated in *Reading Mastery* and *Fundations 2* small group supplementary instruction (Tier II), respectively. (Here after the students will be referred to as *Reading Mastery* students and *Fundations 2* students.) The pre-intervention screening data revealed that all of the students were at risk in two or more reading skills. All but two of the students scored below the benchmarks on the DIBELS assessment. Students 5 and 7 scored above
Table 5. Pre- and Post-Test DIBELS Results for Dyads A-F

<table>
<thead>
<tr>
<th>Dyad</th>
<th>Student</th>
<th>Pre-test DIBELS Results</th>
<th>Post-test DIBELS Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LNF</td>
<td>PSF</td>
</tr>
<tr>
<td>A</td>
<td>Reading Mastery</td>
<td>1</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Fundations 2</td>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>B</td>
<td>Reading Mastery</td>
<td>3</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Fundations 2</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>C</td>
<td>Reading Mastery</td>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Fundations 2</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>D</td>
<td>Reading Mastery</td>
<td>7</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>Fundations 2</td>
<td>8</td>
<td>26</td>
</tr>
<tr>
<td>E</td>
<td>Reading Mastery</td>
<td>9</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Fundations 2</td>
<td>10</td>
<td>23</td>
</tr>
<tr>
<td>F</td>
<td>Reading Mastery</td>
<td>11</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Fundations 2</td>
<td>12</td>
<td>20</td>
</tr>
</tbody>
</table>

*Disc is WRC on the first ORF probe, then discontinued per ORF administration and scoring directions (<10 WRC).
**Med is the median score WRC of 3 ORF probes.

Table 6. Pre- and Post-Test TPRI Results for Dyads A-F

<table>
<thead>
<tr>
<th>Dyad</th>
<th>Student</th>
<th>Pre-test TPRI Results: D/SD*</th>
<th>Post-test TPRI Results: D/SD*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>GK</td>
<td>WR</td>
</tr>
<tr>
<td>A</td>
<td>Reading Mastery</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Fundations 2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>B</td>
<td>Reading Mastery</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Fundations 2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>C</td>
<td>Reading Mastery</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Fundations 2</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>D</td>
<td>Reading Mastery</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Fundations 2</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>E</td>
<td>Reading Mastery</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Fundations 2</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>F</td>
<td>Reading Mastery</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Fundations 2</td>
<td>12</td>
<td>3</td>
</tr>
</tbody>
</table>

*Developed (D) Still Developing (SD)
Table 5. Average Weekly Gains in Phoneme Segments and Nonsense Word Units for Each Dyad

<table>
<thead>
<tr>
<th>Dyad</th>
<th>Student #</th>
<th>Pre-Test NWF Score</th>
<th>Post-Test NWF Score</th>
<th>Average CLS Gain/Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Reading Mastery</td>
<td>1</td>
<td>6</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>Fundations 2</td>
<td>2</td>
<td>5</td>
<td>29</td>
</tr>
<tr>
<td>B</td>
<td>Reading Mastery</td>
<td>3</td>
<td>9</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Fundations 2</td>
<td>4</td>
<td>8</td>
<td>26</td>
</tr>
<tr>
<td>C</td>
<td>Reading Mastery</td>
<td>5</td>
<td>23</td>
<td>86</td>
</tr>
<tr>
<td></td>
<td>Fundations 2</td>
<td>6</td>
<td>16</td>
<td>41</td>
</tr>
<tr>
<td>D</td>
<td>Reading Mastery</td>
<td>7</td>
<td>11</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>Fundations 2</td>
<td>8</td>
<td>12</td>
<td>29</td>
</tr>
<tr>
<td>E</td>
<td>Reading Mastery</td>
<td>9</td>
<td>11</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>Fundations 2</td>
<td>10</td>
<td>10</td>
<td>45</td>
</tr>
<tr>
<td>F</td>
<td>Reading Mastery</td>
<td>11</td>
<td>18</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>Fundations 2</td>
<td>12</td>
<td>2</td>
<td>27</td>
</tr>
</tbody>
</table>
Figure 1. DIBELS progress data for Dyad A (students 1 and 2)
Figure 2. DIBELS progress data for Dyad B (students 3 and 4)
Figure 3. DIBELS progress data for Dyad C (students 5 and 6)
Figure 4. DIBELS progress data for Dyad D (students 8 and 2)
Figure 5. DIBELS progress data for Dyad E (students 9 and 10)
Figure 6. DIBELS progress data for Dyad F (students 11 and 12)
the benchmark on NWF only. TPRI beginning of the year screening results supported the DIBELS fall benchmark scores, with students scoring in the still developing range on Grapheme Knowledge and Phonological Awareness, with one exception. Student 3 scored in the developing range on Grapheme Knowledge, still developing on Word Reading, and still developing on Phonological Awareness.

Student 1 began the year with a LNF score of 22, PSF score of 6, and a NWF score of 6. Following 8 weeks of Reading Mastery and weekly progress monitoring, the student reached a LNF score of 54, PSF score of 44, and a NWF score of 46 in November. Student 2 started the year with a LNF score of 15, a PSF score of 16, and NWF score of 5 and showed variable progress on both PSF and NWF weekly progress monitoring measures. This student did not participate in progress monitoring one week due to school absence. After 8 weeks of Fundations 2 the student reached a LNF score of 32, a PSF score of 62, and a NWF score of 29 in November.

Student 3 began the year with a LNF score of 24, PSF score of 28, and a NWF score of 9. Student 3 missed progress monitoring for the first week of instruction. After the first week, PSF and NWF progress monitoring measures showed steady progress with variability in performance on the NWF measure. Following 8 weeks of Reading Mastery the student reached a LNF score of 32, PSF score of 51, and a NWF score of 27 in November. Student 4 began the year with a LNF score of 24, PSF score of 29, and a NWF score of 8. Following 8 weeks of Fundations 2, the student reached a LNF score of 40, PSF score of 15, and a NWF score of 26 in November; this student missed one day of progress monitoring due to school absence.
Student 5 began with a LNF score of 50, PSF score of 10, and a NWF score of 23 at the start of the year and showed significant progress. This student exceeded the benchmark goals following 8 weeks of *Reading Mastery* with a LNF score of 61, PSF score of 46, NWF score of 86, and ORF score of 65 in November, demonstrating a very strong response to intervention. As a result of this student’s progress he discontinued Tier II services and participated in Tier I only, with regular benchmark screening. Student 6 began with a LNF score of 30, PSF score of 6, and a NWF score of 16, and following 8 weeks of *Fundations 2* reached a LNF score of 40, PSF score of 34, and a NWF score of 41 in November.

Student 7 began the year with a LNF score of 44, a PSF score of 20, and a NWF score of 11. In November, this student reached or exceeded the benchmark goals following 8 weeks of *Reading Mastery* with a LNF score of 56, PSF score of 43, NWF score of 52, and ORF score of 50, demonstrating response to intervention. As a result of this student’s progress she discontinued Tier II services, and resumed Tier I only, with regular benchmark screening. Student 8 began the year with a LNF score of 26, PSF score of 10, and a NWF score of 12. Following 8 weeks of *Fundations 2*, the student reached a LNF score of 44, a PSF score of 42, and a NWF score of 29. This student missed two weekly progress monitoring sessions due to two school absences during the intervention period. Student 8 made progress on LNF and PSF benchmark goals, but showed variable performance on NWF measures.

Student 9 began the year with a LNF score of 14, a PSF score of 31, and a NWF score of 11. In November, this student demonstrated significant progress following 8 weeks of *Reading Mastery* with a LNF score of 53, PSF score of 53, NWF score of 65,
and ORF score of 16, exceeding January benchmark goals on LNF, PSF, and NWF measures. This student missed one progress monitoring session due to school absence. Student 10 began the year with a LNF score of 23, PSF score of 5, and a NWF score of 10. Following 8 weeks of Fundations 2, the student showed steady progress with a LNF score of 48, a PSF score of 41, and a NWF score of 45 in November.

Student 11 and Student 12 were added to the study following Title I screening and dual identification of at-risk status by both DIBELS screening results and Title I screening results. Student 11 repeated kindergarten and had received supplemental intervention in kindergarten. Students 11 and 12 were randomly assigned to Reading Mastery and Fundations 2 small groups respectively. Student 11 began the year with a LNF score of 18, a PSF score of 26, and a NWF score of 18. In November, this student demonstrated variable performance, with slow progress following 8 weeks of Reading Mastery with a LNF score of 47, PSF score of 36, and a NWF score of 31. This student missed one progress monitoring session due to student absence. Student 12 began the year with a LNF score of 20, a PSF score of 15, and a NWF score of 2. In November, this student demonstrated slow but steady progress following 8 weeks of Fundations 2 with a LNF score of 33, PSF score of 39, and a NWF score of 27.

Overall, five out of six students who participated in Reading Mastery instruction exceeded the first grade LNF goal of 37. Student 3 demonstrated progress from the initial LNF benchmark screening score of 22, reaching a LNF score of 32 in mid-November. All six students reached the PSF goal of 35, and five students exceeded this first grade benchmark goal with scores of 44, 51, 46, 43, 41, and 36. Four students in Reading Mastery exceeded the adjusted mid-November NWF benchmark goal of 37 with
scores of 46, 86, 52, and 65. Three of these Reading Mastery students exceeded the mid-January NWF first grade benchmark of 50, as well. Student 3, and Student 11, reached NWF scores of 27, and 31, respectively. Both of these students demonstrated progress on NWF with mid-September NWF benchmark scores of 9 and 18 to 27 and 31, respectively. Three Reading Mastery students exceeded the adjusted November benchmark ORF goal of 10, with scores of 65, 50, and 16. Reading Mastery students 5 and 7 exceeded the January ORF goal of 20 in November with ORF scores of 65 and 50. Student 9 reached an ORF score of 16 in November. Two of the Reading Mastery students were discontinued on ORF at the post-testing due to a score of less than 10 Words Read Correctly on the first ORF probe, One student received a median ORF score of 4 in November.

By comparison, four of the Fundations 2 students met the first grade LNF goal of 37 with scores of 40, 40, 44, and 48, respectively. Two Fundations 2 students, 2 and 12, did not reach the LNF goal of 37 with scores of 32, and 33, respectively. Four students exceeded the PSF first grade benchmark goal of 35, with scores of 62, 42, 41, and 39. Two Fundations 2 students, Student 4 and Student 6, did not reach the kindergarten PSF goal of 35 in November, with scores of 15 and 34. Two Fundations 2 students, 6 and 10, met the adjusted November benchmark goal of 37, with scores of 41 and 45. None of the Fundations 2 students met the mid-year goal of 50 on NWF. NWF scores were, 29, 26, 41, 29, 45, and 27, respectively. Although two Fundations 2 students, 6 and 10, showed significant progress in early literacy skills and almost reached the adjusted November ORF goal of 10 with scores of 9 on ORF in November, none of the Fundations 2 students reached the adjusted goal of 10. Four Fundations 2 students were discontinued on ORF
at post-testing due to a score of less than 10 Words Read Correctly on the first ORF probe.

As noted earlier, on the TPRI pre-test screening, all at-risk students scored in the still developing range on Grapheme Knowledge and Phonological Awareness, with one exception. Student 3 scored in the developing range on Grapheme Knowledge, still developing on Word Reading, and still developing on Phonological Awareness. Student 3 scored in the still developing range on Word Reading. The post-test TPRI results indicated that all at-risk students made progress on the Grapheme Knowledge subtest, scoring in the developed range. Four Reading Mastery students made progress on the Word Reading measure. Students 5 and 7 scored in the developed range, reading 8 words fluently. Students 9 and 11 scored in the still developing range, reading 1 word fluently. All Fundations 2 students and two Reading Mastery students scored in the still developing range on word reading with zero words read fluently on the TPRI post-test. Eleven out of twelve at-risk students demonstrated progress on the Phonological Awareness TPRI post-test measure. Student 2 scored in the developed range. Student 8 demonstrated no progress on the TPRI post-test Phonological Awareness measure with a score of 0. All other students showed progress from the TPRI pre-test to post-test results with scores in the still developing range (Figures 7-12).
Figure 7. TPRI pre-test and post-test data for Dyad A (students 1 and 2)

Figure 8. TPRI pre-test and post-test data for Dyad B (students 3 and 4)
Figure 9. TPRI pre-test and post-test data for Dyad C (students 5 and 6)

Figure 10. TPRI pre-test and post-test data for Dyad D (students 7 and 8)
Figure 11. TPRI pre-test and post-test data for Dyad E (students 9 and 10)

Figure 12. TPRI pre-test and post-test data for Dyad F (students 11 and 12)
Chapter 4

DISCUSSION

Effects of Fundations 2 Instruction

Overall, among the six students who participated in small-group Fundations 2 instruction, four students met the first grade DIBELS benchmark goal on LNF. Student 2 and Student 12 did not meet the LNF benchmark goal. Four Fundations 2 students met the DIBELS first grade benchmark goal on PSF. Student 4 and Student 6 did not meet the first-grade DIBELS PSF benchmark goal. Although two students, Student 6 and Student 10 met the adjusted November DIBELS NWF benchmark goal of 37, none of the students met the mid-year goal of 50 on NWF. None of the Fundations 2 students met the adjusted November DIBELS ORF benchmark goal of 10.

Adjusted benchmark scores were not calculated for November TPRI results because the TPRI measurement scale of 0-3 points does not lend itself to weekly gain score estimates. The beginning of the year still developing and developed criteria remained the same for both the TPRI pre-test and TPRI post-test results. All Fundations 2 students met the TPRI beginning of the year developed goal on the Grapheme Knowledge screening assessment. At the end of the intervention, none of the Fundations 2 students could read any of the words on the TPRI word reading measure. This result suggested that these skills were in the still developing range in November. One Fundations 2 participant, student 2, scored in the developed range on the Phonemic Awareness measure, and five Fundations 2 students scored in the still developing range. These students demonstrated gains during the intervention period from pre-test to post-test on the Phonemic Awareness task.
Effects of *Reading Mastery* Instruction

Among the six students who participated in the small-group *Reading Mastery* instruction, five exceeded the DIBELS benchmark goal of on LNF at the end of the intervention. Student 3 did not meet the first-grade LNF benchmark goal. All *Reading Mastery* students met or exceeded the DIBELS first grade January benchmark goal on PSF. Four of the *Reading Mastery* students exceeded both the adjusted November and January DIBELS NWF benchmarks. Student 3 demonstrated a gain of 18 correct letter sounds per minute on NWF, and Student 11 demonstrated a gain of 13 correct letter sounds per minute, demonstrating a reasonable rate of weekly progress with eight weeks of intervention as determined by the adjusted benchmark rate of 2 correct letter sounds per week. Three of the *Reading Mastery* students exceeded the adjusted November DIBELS ORF benchmark goal of 10, and two of the *Reading Mastery* students exceeded the January ORF benchmark goal of 20, with scores of 65, and 50.

As noted above, adjusted benchmark scores were not calculated for November TPRI results. All *Reading Mastery* students met the TPRI post-test beginning of the year *developed* goal on the Grapheme Knowledge screening assessment. Two of the *Reading Mastery* students scored in the *developed* range on the word reading measure, reading eight words correctly, and one of the *Reading Mastery* students scored *still developing* on the word reading measure, reading one word correctly. Three *Reading Mastery* students could not read any of the words on the word reading measure. All six *Reading Mastery* students scored in the *still developing* range on the Phonemic Awareness measure.

With eight weeks of supplementary intervention, all students in both *Reading Mastery* and *Fundations 2* met or exceeded the 2 correct letter sounds per week rate of
progress calculation for the adjusted November benchmark NWF goal. NWF progress data shown in Table 5 shows that all students made progress on NWF, a measure of decoding and word attack skills; however, when compared comparison, the gains were more modest in the Fundations 2 intervention with a range of average gains of 2 – 4 correct segments each week for Fundations 2 students, compared to a range of average gains of 2 – 8 for Reading Mastery students. Four out of six Reading Mastery students demonstrated an average gain of 5-8 correct segments each week. In five out of the six dyads, Reading Mastery students demonstrated better gains in correct letter sounds with four out of six Reading Mastery students demonstrating gains of 3-5 correct letter sounds more than their Fundations 2 partners. One dyad, B, demonstrated the same gain of an average of 2 correct letter sounds per week. In one dyad, F, the Fundations 2 student demonstrated an average gain of 3 correct letter sounds a week compared to the Reading Mastery student who showed an average gain of 2 correct letter sounds a week. In this case, the Reading Mastery student scored higher on the post-test DIBELS NWF November benchmark probe, but it is important to note that the beginning DIBELS pre-test NWF scores differed by 16 correct letter sounds, and only 4 correct letter sounds on the DIBELS NWF benchmark post-test measure. Overall in this dyad case, the Fundations 2 student showed greater progress over 8 weeks of Tier I plus Tier II intervention, with a gain of 25 correct letter sounds compared to the gain of 13 correct letter sounds for the Reading Mastery student.

The findings from this study showed that all at-risk students made progress in the development of early literacy skills with Tier I plus Tier II reading instruction as measured by individual pre-test, progress monitoring, and post-test data. The students
who participated in Tier I *Fundations* 2 plus *Reading Mastery* instruction scored higher on several measures of reading than students who participated in *Fundations* plus *Fundations* 2. Four of the *Reading Mastery* students reached the year-end goal of 50 on NWF in November. By comparison, although all *Fundations* 2 students demonstrated progress with intervention, none of the *Fundations* 2 condition students met this goal, and only two of the students met the adjusted November benchmark goal. These results suggest that *Reading Mastery*, a highly systematic, explicit, and sequential intervention for reading instruction, demonstrates significant gains in a short period of intervention time. The current findings are in line with prior research that showed that *Reading Mastery* instruction led to significant improvements in student reading skills (Joseph, 2007; NRP, 2000; Schieffer, Marchand-Marella, Martella, & Simonsen, 2007). As a new literacy program available since 2002, research on *Fundations* is in progress. This study provides additional research on *Fundations* for Tier I and *Fundations* 2 Tier II applications.

Although several students in the *Fundations* 2 group were expected to achieve the January benchmark goals with continued intervention support and progress, the *Reading Mastery* students had the strongest overall outcomes. These findings suggest that *Fundations* can enhance reading outcomes for some students when used at the whole-class plus small-group levels, but *Reading Mastery* yielded more success for at-risk students’ reading outcomes when used at Tier II, with a foundation of research-based reading instruction at Tier I. When these two programs were compared directly, *Reading Mastery* led to better outcomes for students. These results are consistent with prior
research which has shown that direct and systematic reading instruction is effective for
students at risk for reading difficulties (e.g., Foorman, 2001: NRP, 2000).

In both Reading Mastery and Fundations 2 students are taught to recognize
vowels, consonants, digraphs, blends, digraph blends, and, to identify word parts such as
syllables, base words and suffixes in an explicit and systematic sequence. Although both
Reading Mastery and Fundations 2 are research-based with an emphasis on phonemic
awareness, letter-sound correspondences, and word recognition at the first grade level,
the delivery of instruction differs. The differences in instructional format may have
contributed to the individual student progress results. For example, Reading Mastery is
designed as a scripted program with a controlled, scaffolded sequence of introducing new
letter sounds. Reading Mastery instruction focuses on explicit controlled instruction and
introduction of vowels and consonants to form cvc words that represent high frequency
words and syllables. All letters and matching sounds are taught before students are
introduced to words containing the letter sound combinations. Each lesson involves a
high degree of repetition and practice, and letter sounds and combinations are continued
as strands over multiple lessons. Reading Mastery begins with teacher modeling of new
skills, letters, sounds, letter combinations, and word reading, followed by guided small
group practice, ending with teacher confirmation of individual student mastery of each
skill within the daily lesson before moving on to the next skill or activity. Mastered skills
are reviewed and practiced in future lessons, as well. The required verbal participation of
all students in group and individual activities allows the teacher to accurately determine if
individual students have mastered each skill. With this tightly sequenced, systematic,
explicit, scaffolded instruction, each student has multiple opportunities to practice and
master each skill in a lesson on a daily basis. In addition, the scripted lessons contribute to a high degree of treatment fidelity with objectives, teacher directions, and student responses, and teacher verbal feedback clearly printed for each activity within a lesson.

Like Reading Mastery, Fundations 2 is developed as a highly systematic and explicit program with concepts introduced in small increments and practiced and reviewed frequently to foster mastery. Teacher materials include a teacher manual and a CD-Rom, puppets, sound cards, sentence and syllable frames, a home support packet and a fluency kit at Level 1. The teacher manual presents the lesson content in a detailed format with units, lessons within units, an overview of the lesson, materials needed, descriptions of the activities and a structured daily plan, along with a master plan for each unit. Fundations 2 offers a variety of multi-sensory engaging activities which include puppets for introducing letters and letter sounds, a tapping method in which students tap out the individual phonemes in a word with their fingertips, then blend the phonemes into a word. Students learn a letter-keyword-sound combination for each letter of the alphabet, and practice letter to sound and sound to letter combinations. Students use magnetic tiles to form words and sentences, and sky writing to practice letter formation and spelling the sounds in words. The activities are varied throughout the week in thirty minute daily lessons.

Although Fundations 2 offers a variety of engaging games and activities that are appealing to both teachers and students, the level of repetition and opportunities to practice new skills, individual participation opportunities, and individual mastery confirmation appears to be lower than designed and required in Reading Mastery. The Fundations 2 teacher manual offers detailed instruction plans, but teacher fluency and
consistency of instruction for each activity are required to establish treatment fidelity. Pace of instruction, repetition, and opportunities for students to practice to mastery are essential components for effective instruction and intervention, particularly for identified at-risk students (Brown-Chidsey & Steege, 2005). These differences in instruction format and delivery may account for the higher overall gains achieved by students in the Reading Mastery intervention.

Instructional Implications

Similar to work done by Linan-Thompson and Hickman-Davis (2002), both the Reading Mastery and Fundations 2 outcomes indicated that it is possible to improve students’ reading skills in as little as 30 minutes per day. It is important to note that all six of the Reading Mastery students achieved the PSF first grade benchmark goal following eight weeks of intervention, which is consistent with previous research documenting the efficacy of Reading Mastery, with an emphasis on phonemic awareness and phonological awareness, essential foundational skills for early literacy development and reading achievement (Joseph, 2007; NRP, 2000). The results showed that Fundations 2 instruction helped some of the most at-risk students in this classroom, but was not sufficient intervention to reach the benchmark goals.

All of the students who received Reading Mastery instruction showed reading gains, but they did not reach all goals. One student did not reach the LNF first-grade benchmark goal, two Reading Mastery students did not meet adjusted NWF benchmark gains, and three Reading Mastery students did not reach adjusted ORF benchmark goals. Since each of these students showed progress with Reading Mastery, it is possible that the duration of the study was not long enough for the intervention to yield optimal results.
If the students continued to make progress, but did not meet the benchmarks over a longer time frame (e.g., 12-18 weeks), perhaps these students would benefit from participating in more intensive *Reading Mastery* instruction, such as a smaller group size or longer duration of instruction time per lesson. RTI protocols call for adapting the instruction in light of the student’s learning needs. Since all of the students made some gains while receiving the instruction, it appeared that the two programs helped in measureable ways. In the case of the students in this study who were not on track to achieve the benchmark, more intensive instruction would be a logical hypothesis to test.

Universal screening to detect reading problems early, and providing at-risk students with additional research-based systematic, explicit instruction, with modeling, and multiple opportunities to practice represents best practice (Joseph, 2008). The stronger outcomes seen among the students who participated in two tiers of *Fundations* and *Reading Mastery* instruction lend converging support to the finding that increased instruction and practice times yield consistently better outcomes (Daly, Chafouleas, & Skinner, 2005; Kame’enui & Carnine, 1998). The outcomes obtained in this study also provided evidence that *Fundations* 2 instruction did make a difference for the at-risk students, as all students made progress from their initial fall benchmark scores. As a new intervention, there has been limited research on *Fundations* 2 thus far. A report by the Florida Center for Reading Research (2008) indicated that *Fundations* has the instructional elements necessary for effective reading intervention but that more research is needed on its effects. The current study showed that students did make gains with the *Fundations* 2 method, however these gains were not as strong as those made by students in *Reading Mastery*.
Limitations and Future Research

The outcomes of this study must be interpreted cautiously due to a number of limitations. First, the study participants were selected from intact groups of students in two classrooms. Although this design is not unusual in educational research, it does limit the generalizability of the findings. The AB case study design presents limitations due to the lack of a withdrawal condition. This limitation is mediated by the typical lack of regression for students in acquired reading skills; however, this procedure does not control for any competing explanations for why the target behavior or in this case reading skill changed. Only one of the students qualified for free or reduced cost lunch indicating that the sample included students from median to higher income homes. Certain features of the class groupings themselves, or the way in which class composition was determined, may have contributed in unidentifiable ways to the outcomes. For example, eight at-risk students were in one classroom with four at-risk students in the second classroom. Although treatment integrity appeared consistent across classrooms and in the small group intervention setting, it is important to note that one Tier I Fundations classroom teacher had much more experience than the other, and the Fundations 2 teacher was recently trained in Fundations. Instruction at both Tier I and Tier II may be enhanced with more teacher experience and on-going professional support. Although treatment integrity with adherence to lesson plans appeared high with the trained paraprofessionals delivering the Reading Mastery and Fundations 2 instruction, it is important to note that this was their first teaching experience with each instructional method.
Certainly, additional research should seek to replicate the present findings using various assessments. Additional research is needed to replicate and extend the study outcomes. An area of future research could include the study of methods to strengthen Fundations. To extend this research, another area of future research could include the study of the effects of Tier II: Reading Mastery following evidence of a lack of sufficient progress with Tier 2: Fundations 2 small group intervention. More research is needed to determine appropriate Tier II Intervention modifications, such as changes in intensity, frequency and/or duration for both Reading Mastery and Fundations 2.
Chapter 5

SUMMARY

This study compared reading scores from students in two different levels of Fundations instruction, Fundations and Fundations 2, to students in Fundations and Reading Mastery. All of the participants were identified as being at-risk for reading difficulties at the start of the school year. Although all students made progress from their initial baseline scores, findings showed that the Reading Mastery students performed better on a set of reading outcome measures than Fundations 2 students. The students who received Fundations plus Reading Mastery instruction showed the best overall results. Two out of six of the students who participated in Tier I Fundations and Tier II Reading Mastery instruction exceeded the year-end oral reading fluency goal in November. Three of the students exceeded the mid-year nonsense word fluency goal in November. One student was expected to meet the mid-year Nonsense Word Fluency goal with continued instruction and progress. Two of the Reading Mastery students were not expected to meet the mid-year nonsense word fluency goal and increased intervention was recommended. None of the students who received two tiers of Fundations met the year end goal in November. Two students were expected to meet the mid-year January benchmark with continued instruction and progress. Changing their Tier 2 intervention to Reading Mastery was recommended as an effort to increase the rate of progress toward the mid-year benchmark goals. Nonetheless, these findings showed that Fundations 2 yielded positive outcomes as all students made reading progress. Treatment integrity and the need for significant training and on-going professional support is noted.
REFERENCES


**BIOGRAPHY OF THE AUTHOR**
C. Lee Goss was born in New Orleans, Louisiana on November 20, 1959. She was raised in New Orleans, Louisiana and Vienna, Virginia, and graduated from James Madison High School in 1977. She attended the University of Virginia and graduated in 1981 with a Bachelor of Arts degree in English Literature and Speech Communications. She moved to Maine in 1983 and entered the School Psychology graduate program at The University of Southern Maine in the fall of 2000. She graduated with a Master of Science degree in School Psychology in 2003. Along with her Master’s degree, Lee has earned the following credentials, Certified School Psychological Service Provider (CSPSP), Nationally Certified School Psychologist (NCSP), and Licensed Psychological Examiner (LPE). Currently, she is a member of the National Association of School Psychology (NASP), the International School Psychology Association (ISPA), and the Maine Association of School Psychology (MASP). She returned to The University of Southern Maine to enter the first class of the School Psychology doctoral program in the fall of 2005.

After receiving her degree, Lee will provide comprehensive school psychology services in private practice with a focus on early intervention and prevention methods. Lee is a candidate for the Doctor of Psychology degree in School Psychology from The University of Southern Maine in December, 2008.